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ABSTRACT

This report discusses the types and results of tests used on 142 "reasonably representative" American Indian bilingual students at the Institute of American Indian Arts in Santa Fe, New Mexico. Major hypotheses of the study were that (1) there is a factor in the abilities of an English-as-a-second-language speaker which can be isolated as English langauge ability; (2) a low TOEFL (Test of English as a Foreign Language) score will occur with poor adjustment scores; and (3) there will be a significant difference in the mean scores of the two intelligence tests used (the Otis Gamma Verbal and the Chicago Nonverbal). Results seem to warrant two conclusions: (1) the TOEFL is a valid measure of English language skill of American Indian students; results are close enough to those of the non-native speakers of English for whom the test was written to suggest strongly that similar abilities are being measured; and (2) since the TOEFL and ITED (Iowa Test of Education Development) do not factor out into different factors, ITED also measures language ability. ITED may be too hard for the students, however. It is recommended that American Indian students be given the same consideration as foreign students, with intensive or semi-intensive instruction in English as need, and adjustment of course load if indicated. (AMM)

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THE RELATION OF A TEST OF ENGLISH AS A SECOND LANGUAGE TO MEASURES OF INTELLIGENCE, ACHIEVEMENT, AND ADJUSTMENT IN A SAMPLE OF AMERICAN INDIAN STUDENTS

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The Problem

The major problems that face all who deal with the education of American Indian children are their low level of achievement in academic studies and the small number who qualify for higher education. A study by Coombs in 1958 found that on standardized tests Indians fell well below national norms, and the higher the grade level they reached, the farther behind they were. Eight years later, the Coleman study found that Indian reading and verbal ability scores in the twelfth grade showed a mean more than three grade levels behind the average metropolitan white student (Coleman 1966, p. 270).

Verbal ability is not the only handicap the Indian student faces. The Coleman report found that two measures of attitude--self-concept and sense of control over the environment--correlated more closely with school achievement than any other variables in the learning situation (Coleman 1966, pp. 319-24). Self-concept was the more important of the two for white students, while among Indians a sense of control over the environment proved to be the major factor.

A feeling of lack of control over the environment--a lack of western tendency to attack unfamiliar situations directly and overcome them by force--are culture traits of Indian societies (Zintz 1969, pp. 18-19). This cultural predisposition of the Indian student is combined with the

requirement to carry on all school work in English, a language that he may not learn until he enters school. Severe retardation in reading and verbal ability apparently often occur.

Reading problems are reliably related to personality problems--studies quoted by Park and Linden show that the best differentiating factor between poor readers and good readers is personal adjustment. They also state that "illiteracy and/or foreign language in the home and insufficient background were characteristic of reading failures" (Park and Linden 1968, p. 326).

The ability of the Indian to take his rightful place in the larger society of the United States depends to a great extent upon the development of Indian leaders. In a modern technological society, college education is almost a prerequisite for leadership in many fields. Yet Indians are not going to college in sufficient numbers. In New Mexico, only 10% of Indians complete highschool, compared with 27% of the general population (which includes Mexican-American bilinguals). (Smith 1968, p. 11). More than junior /thirty percent of students who enter/ highschool drop out between the eighth and twelfth grades (SWCEL 1969, p 7). Fewer than 1% of Indians graduate from a four-year college (Smith, loc. cit.).

We thus have a two-fold problem: first, to find ways to identify with reasonable accuracy those Indian students who might succeed in college, so that the sorely needed Indian educational leaders will be developed. And second, to find data that will help us determine the major sources of Indian students' achievement failures, so that we can design learning situations that will carry with them a great chance of success for the Indian student.

The Theory

The theoretical foundation upon which this investigation is based is that second-language learning is different in essential ways from learning that takes place in one's primary language, whether before school age or during school; and that realistic educational intervention requires an understanding of the difference and of the effect it may have on all facets of the students' lives. Among the needs that this difference creates is the need to be able to test reliably the second-language component of the student's knowledge, separate from general academic achievement, and to discover how language achievement is related to personal adjustment.

The language learned in childhood is the major means through which the growing mind orders its processes of cognition and affection. In the words of Edward Sapir, "The fact of the matter is that the 'real world' is to a large extent unconsciously built up on the language habits of the group. ...We see and hear and otherwise experience very largely as we do because the language habits of our community predispose certain choices of interpretation. ...No two languages are ever sufficiently similar to be considered as representing the same social reality" (Sapir 1961, p. 69). The "thing" world may be the same for us all, but it is organized in consciousness in terms of the categories and relations that a specific language provides (Whorf 1956, pp. 239-45).

Learning a second language involves learning new sounds, grammatical-morphological patterns, word meanings, and a new underlying world-view or way of ordering data given by experience to consciousness. All of these must be added to or substituted for an existing system, the first language.

They are not learned in direct response to developing consciousness of the world, as the first language is. They are not learned from the all-important Significant Others--parents or parent-surrogates--but from strange, often feared adults of a different cultural world. The learning situation itself may create tensions leading to failure, especially if the learner is deprived of the support of his primary social group. School is still an extremely threatening place to many Indian children (Styles of Learning 1968, p. 1).

The speed and efficiency of second-language learning depends not only on the feeling of the learner toward his new experience, but to some extent on the similarity between the two languages. We would expect that learners of English as a second language will succeed to a different degree depending on their native language. Indian students are bilinguals whose first language is very different from English in almost every dimension. Whorf, in his article "Languages and Logic" (1956, pp. 233-345) gives numerous examples of the extreme differences between English and Indian ways of organizing thought in language terms.

Testing the Second Language

The Test of English as a Foreign Language (TOEFL) was put into use in 1964 to help colleges choose and place students from abroad. Some of these students speak Indo-European languages, but many come from language backgrounds as different from English as Indian languages. If the test is valid for these students, and colleges have found it generally useful, it should also be a valid measure of the English ability of Indian students for the same purpose.

It is difficult to determine the effect of language competence on other facets of the student's development. However, our theory that the primary language is the individual's most important link with the world of Others must lead to the expectation that any change of language would have an effect on the total personality.

Measures of personality are less objective than mea sures of language and academic achievement. Nevertheless, if correlation exists between such measures, it can be considered at least indicative of a relation between adjustment and achievement.

If standardized tests and intelligence tests are taken at face value for Indians, the Indian is stereotyped as a second-class learner. The "crossover" that takes place at about the third or fourth grade, when Indian children's achievement starts downhill in relation to their white classmates is, if the theory of this study is correct, partly the result of inadequate learning of English and partly the result of the strain that the shift to English creates on the developing personality. The inadequate learning of English may be partly due, in turn, to negative or ambivalent attitudes to the dominant white culture, which is pressing hard on the Indian cultural identity the child has only partially established--Lambert and Gardner (1961) clearly identified set or attitude toward the speakers of a language as relevant variables in the success of the learner.

A reliable measurement system that will tell us where the student stands in English, what his general personality adjustment is, and how these relate to the more common measures of intelligence and scholastic achievement could have great significance. First we would be able to identify students most likely not to fail in college because of a language

handicap, whatever their standard achievement test showed. The language competence level can either be used as a guide to the most appropriate course for the student to attempt, or to remedial measures that should be taken before or concurrently with college work. Less directly, the knowledge we gain from the relationships that are established between language, intelligence, achievement and adjustment can guide us in planning more effective and hopefully less damaging language training for bilingual Indian students.

Hypotheses

Our theory of second-language learning suggests a major hypothesis of this study: there is a factor in the abilities of an English-as-a-second-language speaker which can be isolated as English language ability.

In all pencil-and-paper tests, it is accepted that language skill is a major factor. This is true for native speakers as well as non-native speakers, so that students from impoverished language backgrounds, or those who speak non-standard dialects, are handicapped on achievement tests and verbal intelligence tests. Nonverbal tests were created to circumvent this handicap in the measurement of intelligence. However, verbal abilities are in fact more relevant to the largely verbal learning we wish to measure and/or predict than are other abilities (Wessman 1967, p. 270). The TOEFL would, we hoped, separate English ability from a generalized "verbal ability" factor.

Our second hypothesis was that a low TOEFL score would occur with poor adjustment scores. The student who is unable to handle the language of instruction, trapped in a school situation, will suffer damage to his

feelings of self-worth and social adequacy.

Two measures of intelligence, the Otis Gamma verbal and the Chicago nonverbal, are included in the battery of tests to be correlated in this study. A third hypothesis, related to the importance of English language ability to test success, was that there would be a significant difference in the mean scores of the two types of intelligence tests. This finding would corroborate many previous studies of language-handicapped learners. Verbal intelligence scores in the dull or dull-average range often go with average or above average non-verbal scores.

The correlation between scores of male and female students were examined, assuming that males would surpass females, consonant with Indian cultural patterns (Styles of Learning 1968, p. 5).

The correlations between scores of students at different grade levels were analyzed to determine if the expected growth from the ninth through thirteenth years of school actually occurred.

In testing the hypotheses, where probability was an appropriate dimension, a .05 or .01 level of significance was sought.

Definitions

Specific English language ability is defined in this paper as the score made by a student on the composite TOEFL, and on subtests of the TOEFL.

Nonverbal intelligence is defined as the score made by a student on the Chicago Non-Verbal Examination.

Verbal intelligence is the score made by a student on the Otis Quick-Scoring Mental Ability Test, Gamma.

Achievement is defined as the score made by a student on the composite of the Iowa Test of Educational Development and the subtests of this test.

Adjustment is defined as the scores made by students on the tests of the Bell Adjustment Inventory.

Review of Literature

The concept basic to a correlation study of this type is that finding significant correlations between different types of measurements will give us useful information about the bilingual Indian student's personality and educational development. The literature was examined, therefore, in terms of two major elements: bilingualism and its effect on learning, and the findings of tests that have been used with Indian and other bilinguals.

The most complete study of bilingualism was made by Uriel Weinreich (1953). He reports a number of research studies proving a degree of personality handicap in the bilingual individual. A study by Dorothy Spoerl (1946) concluded that the high frequency of maladjustment among bilingual college freshmen of her sample had resulted from cultural conflicts within their bilingual homes, rathern than from bilingualism. Richard Diebold (1966) found that bilingualism may facilitate performance on both verbal and non-verbal intelligence tests. However, he also found that antagonistic acculturative pressures from a sociologically dominant monolingual society could create cases of bilingual psychopathology.

Lambert and Macnamara (1969) were unable to find any support for their theory that bilingual experience enhances cognitive flexibility.

Thus, in general, the literature seems to suggest that although bilingualism is not necessarily a handicap to adjustment and achievement, cultural pressures may cause it to have a negative effect.

Since Indian students are certainly a linguistic minority in a "sociologically dominant monolingual society" (to quote Diebold, 1966), the literature lends support to our theory that their English language learning problems may have an adverse effect on both their general learning ability and their adjustment.

Much has been written about intelligence testing, concluding that verbal tests, at least, cannot really be said to measure an innate ability apart from learning; and since the learning is verbal, it must depend to a large extent on the language involved. Indeed, the relevance of intelligence tests in education has recently been questioned in a global sense. Such tests seem to predict future school success or failure, but they do not indicate specific directions in which behavior might be altered in order to influence this outcome (Barritt 1967). Strong evidence that intelligence test scores change over time as a function of the interaction between the student and his environment (Moriarty 1966) leads us to question the use of any single intelligence measure to stereotype the child. Intelligence tests do not suggest ways in which the child's learning could be increased, but low scores indicate to the teacher that he will not do well, and the role of teacher expectation in educational outcomes has been well documented.

The literature on intelligence tests of American Indian children, dating as far back as 1928, shows a difference between verbal and non-verbal IQ scores. Jameson and Sandiford administered both types of tests

to 717 mixed-blood Indians in Southern Ontario and found a difference of 5 IQ points in favor of the nonverbal tests (Jameson and Sandiford 1928, pp. 536-51). Later comparisons of the same kind showed that IQ on the nonverbal test was 10 to 14 points higher than on the verbal measure (Garth and Smith, pp. 376-81). In 1944, Sioux children were given the Grace Arthur Point Performance Scale, a battery of nonverbal tests, and the Kuhlmann-Anderson verbal test. The average IQ on the Kuhlmann-Anderson was 82.5, and on the Arthur test 102.8. The correlation coefficient between the two sets of scores was .53 (Havighurst 1957, pp. 105-14).

More recently, the Chicago Non-Verbal examination was given to 700 Indian students at Sherman Institute. The mean score was 95.1 (Paxton 1965). Students of the same school later were given the WISC and WAIS tests, on which the Full Scale mean was 87.3, while the Performance Scale alone produced a mean of 97.1.

Malcolm Garber (1968) using the Illinois Test of Psycholinguistic Development, reports that Indian children rank well below even Spanish-American bilingual children on all measures of psycholinguistic ability except visual-motor tasks.

The poor performance of Indian children on standardized tests is too well known to need further documentation. Coleman (1966), Zintz (1963), Smith (1968), and Coombs (1958) all presented the sad picture of achievement scores lagging from two to eight years behind the national norms. A recent item analysis made for the California Achievement Tests of Indian students at Sherman Institute discovered major areas of learning deficit which could be attributed to bilingualism and cultural difference

(Bates 1969).

The concept that a test of specific English language ability may show Indian students to be more like foreign students than they are like middle-class white native-speakers is given support by a study made at the University of New Mexico in 1969. Native-speaking students who ranked below the 29th percentile on the American College Tests scored high and within a narrow range on the TOEFL (Table 10), showing that the test is inappropriately easy for native speakers (Comparison, 1970, p. 24).

Design of the Study

The students in this study attended the Institute of American Indian Arts (IAIA) in Santa Fe, New Mexico. They were recruited from all over the United States, and are, we felt, reasonably representative of all types of Indian bilinguals. (See Table 1 for language families represented.) However, these students were not selected for academic excellence, but for artistic ability, and in this respect they are not representative of all students. Also, some relevant information, such as the age at which each student first began English and the amount of English used in the home, could not be obtained.

Table 1

LANGUAGE FAMILIES	BOYS	GIRLS	TOTAL
Tanoan	26	25	51
Uto-Aztekan	11	8	19
Keresan	6	7	13
Athabaskan (Apache)	3	8	11

(LANGUAGE FAMILIES)	(BOYS)	(GIRLS)	(TOTAL)
Algonkian	5	7	12
Athabaskan (Navajo)	9	1	10
Siouan	5	2	7
Eskimo, Sahaptian, Iroquois	6	2	8
Zuni	1	3	4
Other	6	1	7
Total	78	64	142

LANGUAGES REPRESENTED WERE:

Tanoan: Tiwa (6), Tewa (33), Towa (11), Kiowa (1)

Uto-Aztekan: Ute (7), Pima-Papago (6), Shoshone (3), Hopi (2), Comanche (1)

Keresan: (13)

Athabaskan, Apache: (11)

Algonkian: Blackfeet (3), Cheyenne (2), Ottawa (1), Passamaquoddy (1), Gros Ventre (2), Chippewa (2)

Athabaskan, Navajo: (10)

Siouan: Crow (1), Sioux (5), Winnebago (1)

Eskimo: (3)

Zuni: (4)

Sahaptian: Yakima (1), Nez Perce (2)

Iroquois: Cherokee (2)

Other: Chocktaw (1), Hualappi (1), U.S. (2), Spanish speaking (3)

The diversity of language families represented made it difficult to draw any conclusions regarding language background influence on English skills. The sample of each language was too small in most cases to pro-

vide valid comparisons. In addition, the students from different language backgrounds also came from such diverse environments that it would be impossible to determine that language was the only or even the major cause of differences in scores. In the final analysis, 9 students had to be omitted because they had missed two or more tests.

With the exception of the TOEFL, the instruments used in this study were tests well known to educators. A brief description of each tests follows.

1. The Otis Quick Scoring Mental Ability Test, Gamma. For grades 9-16. Revised in 1954 from an earlier Otis Higher Level test. More than two-thirds of the test measures some form of verbal competence. The test has proved reliable over many years of use as a reasonably good predictor of school success (Lefever, 1941).

2. Chicago Non-Verbal Examination. "...designed specifically for those children who are handicapped in the use of the English language....those who come from homes where a foreign language is spoken, or from communities or institutions where there is a meager use of the English language...." (Brown 1940, p. 2).

The Chicago Non-Verbal Examination correlated with the Otis Quick-Scoring Mental Ability Test, Gamma at .39 at the 3% level of significance, as measured by a sample of college juniors in a psychology class (Allen 1950, p. 394). In another comparison, a correlation of .67 was found between the Chicago Non-Verbal Examination and the Otis Intermediate, a version of the Otis Quick-Scoring Mental Ability Test designed for students from age eight through fifteen.

Although the nonverbal test consists entirely of figures and pictures,

many of them must be manipulated in response to oral instructions. One reviewer said of the examination: "The instrument shows how difficult it is to devise tests which do not make use of verbal concepts in some form. Of the ten tests in the battery, only four appear entirely free of such concepts, while the remaining tests make wide demands on general information and knowledge of things associated with everyday life" (Pignatelli 1940, p. 1387).

3. Test of English as a Foreign Language. This is composed of five sections measuring various aspects of second-language skill: Listening Comprehension, English Structure, Vocabulary, Reading Comprehension, Writing Ability, and Composite. Part scores are useful for diagnostic interpretation, since they identify specific areas of strenght or weakness in overall performance (Interpretive Information 1970, p. 4). The test had been administered to 113,975 students from February 1964 through June 1969. Norms are based on the performance of these students.

The validity of TOEFL for predicting college success depends to a great extent upon special characteristics of the college involved. Each college presumably should set its own TOEFL norms. Data have been collected, however, which give a general range of TOEFL scores within which certain outcomes can be expected. Table 2 below reproduces these expectations.

Table 2

TOEFL SCORES	POSSIBLE ACTION
550 and above	No restrictions. Students may be admitted to full-time study in any field. No English as a Second Language courses seem necessary.

(TOEFL SCORES)	(POSSIBLE ACTION)
450-549	Students appear to need some English as a Second Language training. No restrictions in course load seem necessary.
300-449	Reduced study load; considerable English as a Second Language is needed--perhaps a two-semester sequence of "intensive" or "semi-intensive."
200-299	Student requires full-time intensive English as a Second Language instruction. He is not ready for subject-matter courses in a U.S. university.

4. Iowa Test of Educational Development. An achievement test consisting of eight subtests: 1. Understanding of basic social concepts; 2. General background in the natural sciences; 3. Correctness and appropriateness of expression; 4. Ability to do quantitative thinking; 5. Ability to interpret reading materials in the social studies; 6. Ability to interpret reading materials in the natural sciences; 7. Ability to interpret literary materials; 8. General vocabulary; 9. A composite of scores 1-8. The test is presented in written form and every part makes considerable demands on English language ability, aside from content knowledge.

5. Bell Adjustment Inventory Revised (1962) Student Form. This inventory includes six measures: 1. Home adjustment; 2. Health adjustment; 3. Submissiveness; 4. Emotionality; 5. Hostility; 6. Masculinity-femininity. On each test with the exception of 6, a high score indicates that a problem may exist in that field, while a low score shows apparent satisfactory adjustment. On the M-F scale, a high score shows a preponderance of masculine interests.

Data Analysis

Test scores were obtained in standard-score or IQ form. The data were run through two computer programs, one-way analysis of variance and factor analysis.

We were mainly interested in the differences between boys and girls, grade levels, and language backgrounds. The significance of differences between the means were determined by analysis of variance.

We examined our data in four sets, according to the tests the students had taken. Set One consisted of 78 students in grades 9-12: 43 boys and 35 girls. These students took five tests: Verbal IQ (VIQ), Non-Verbal IQ (NVIQ), TOEFL, ITED, And Bell Adjustment Inventory (Bell).

Set Two was made up of 16 students, 5 boys and 11 girls, in grades 9, 11, and 12. These students took the VIQ, NVIQ, TOEFL, and ITED.

Set Three comprised 33 students, 21 boys and 12 girls, all in grade 13. They took VIQ, NVIQ, TOEFL, And Bell.

Set Four included all the other sets and six additional students, 3 girls and 3 boys in grade 13 for a total of 133. This set examined only VIQ, NVIQ, and TOEFL scores. Table 3 shows the grade-sex division for all students.

Table 3

GRADE	MALE	FEMALE	TOTAL
13	24	15	39
12	20	9	29
11	16	17	33
10	7	8	15
9	5	12	17
Total	72	61	133

Approximately half the students were at the grade level for which the TOEFL was intended--ready to enter college.

IQ Comparisons

Verbal and nonverbal IQ scores showed the expected difference--nonverbal means being consistently higher than verbal throughout the analysis. For all 133 students, the mean verbal IQ was 90.6 (sd. 9.8) and mean nonverbal IQ 107.7 (sd. 15.6). This difference is significant beyond the .001 level. The correlation coefficient between the two is .52, almost exactly that obtained in the 1944 Sioux study (Havighurst 1957).

Table 4 shows the differences in the two IQ measurements by language background. There are apparent language-background differences reflected, but the number in each tribal group is too small for these to be considered significant. High scores, sometimes reaching the .01 level of significance in the analysis of variance between scores on different tests, were frequently found among the Algonkian, Keresan, and Siouan groups. However, since there were only 8 Algonkian students, 12 Keresan and 6 Siouan subjects whose tests scores could be considered, not too much importance can be attached to these scores. It is all too likely that these groups happened to include some of the most able students, regardless of language.

The IAIA mean on the NVIQ compared with the mean obtained at Sherman Institute in 1965 shows:

Sherman Institute	95.01--sd. 16.8 (Paxton 1965)
IAIA	107.7 --sd. 15.6

IQ by Language Background

Language Background	No. of Subjects		Verbal IQ	Nonverbal IQ	F
Tanoan	49	Mean	87.8	102.53	F30.17**
		SD	8.4	16.9	
Uto-Aztekan	19		91	111	F28.62**
			11.7	16.9	
Keresan	13		93.5	109.9	F9.49**
			14.8	14.7	
Athabaskan (Apache)	10		87.7	104.5	F13.19**
			7.6	13.4	
Algonkian	12		96.5	115.8	F50.01**
Athabaskan(Navaho)	8		87.8	109.6	___
			8.9	12.6	
Siouan	6		95.3	111.	
			4.8	8.8	
Eskimo,Sahaptian	4		92.8	126.8	
			5.9	3.2	
Zuni	4		92.	109.3	
			6.2	11.9	
Iroquois	2		97	104	
			17	5.7	
Other	6		83	94.5	
			8	19.6	
Total	133				

F was not obtained for groups totalling fewer than 10 students.
** Significant at .01 level.

Mean of the total group was VIQ: 90.4, SD 9.9. NVIQ 107.8, SD 15.6. F118.12***
An analysis of covariance, using the Verbal IQ measure as the standard by which to adjust the Nonverbal IQ scores reached an F of 1.83, barely short of significance. Thus we will have to conclude that the differences between VIQ and NVIQ are not really as significant as Table 4 above seems to indicate. The apparent significance is the result of a difference caused by extreme scores in either direction.

This difference may be attributable to the wider grade spread of the Sherman Institute students, a small percentage of whom were in grades seven and eight; or to the fact that students especially selected for artistic interests and ability exceed the average Indian student in nonverbal intelligence. A direct verbal measure from Sherman is not available for comparison, but the Sherman Institute mean on the Full Scale WISC and WAIS, 87.3, seems to reflect the same sort of discrepancy between verbal and nonverbal scores as the other studies. (Bates 1969)

Boys and girls showed a mean difference in NVIQ--boys 109.2, girls 104.8. Verbal IQ showed little difference--boys 90.7 girls 90.5 Neither differnce was statistically significant at the .05 level.

ITED Comparisons

IAIA students scored very low in the ITED. Table 5 shows the grade level, mean score on each subtest, and approximate percentile of national norms represented by this score. The school mean fell below the national tenth percentile. Table 6 shows in graphic form the mean score of the entire group on each subtest in relation to the national percentile norm. The school median was below the national 25th percentile. Fewer than 7% of students reached the 50th percentile.

Table 7 shows in graphic form this highly skewed distribution. It suggests that the ITED is too hard for a large number of these students, since scores in the very low percentiles are obtainable by random guessing.

The internal correlations of the ITED are reasonably high. Table 8 shows the correlations for Set One. This does not differ greatly from the internal correlations of this test with the norm group (ITED Manual 1966, p. 23.).

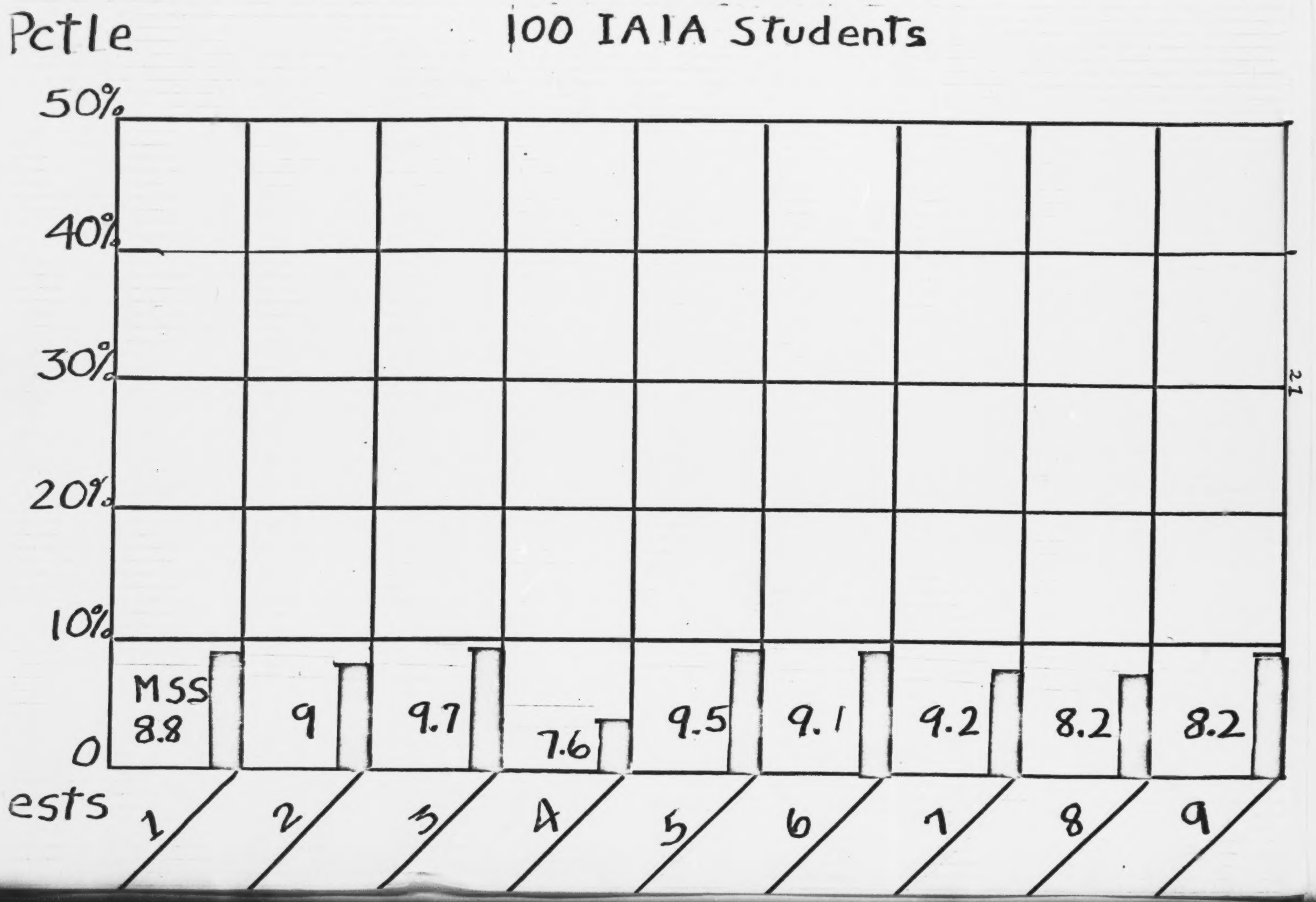
Table 5

		Grades of IAIA Students (Number: 100)							
		9		10		11		12	
	ITED SUBTESTS	Mean Score	Pctle	Mean Score	Pctle	Mean Score	Pctle	Mean Score	Pctle
1.	Understanding basic social concepts	7.5	3	7.1	3	9.6	6	9.6	3
2.	Background in the natural sciences	7.2	6	8.7	4	10.2	6	9.0	3
3.	Correctness and appropriateness of expression	6.4	1	9.3	3	10.6	3	10.5	2
4.	Ability to do quantitative thinking	6.6	2	7.8	2	8.7	3	7.0	2
5.	Ability to interpret reading materials in social studies	6.8	2	10.6	9	10.4	8	9.2	2
6.	Ability to interpret reading materials in natural science	7.4	3	9.7	8	9.9	5	8.9	2
7.	Ability to interpret literary material	5.6	1	9.5	9	10.5	8	9.3	5
8.	General vocabulary	7.2	3	8.3	3	8.8	3	8.1	2
9.	Composite 1-8	5.6	2	8.5	3	9.3	6	8.1	3

Mean standard scores on ITED and percentile of the ITED national norm represented by these scores in grades 9-12.

ITED MEAN SCORES compared with Percentile Norms

100 IAIA Students



ITED PERCENTILE

IAIA

Number: 100
47% below 10th Pctle of Norm

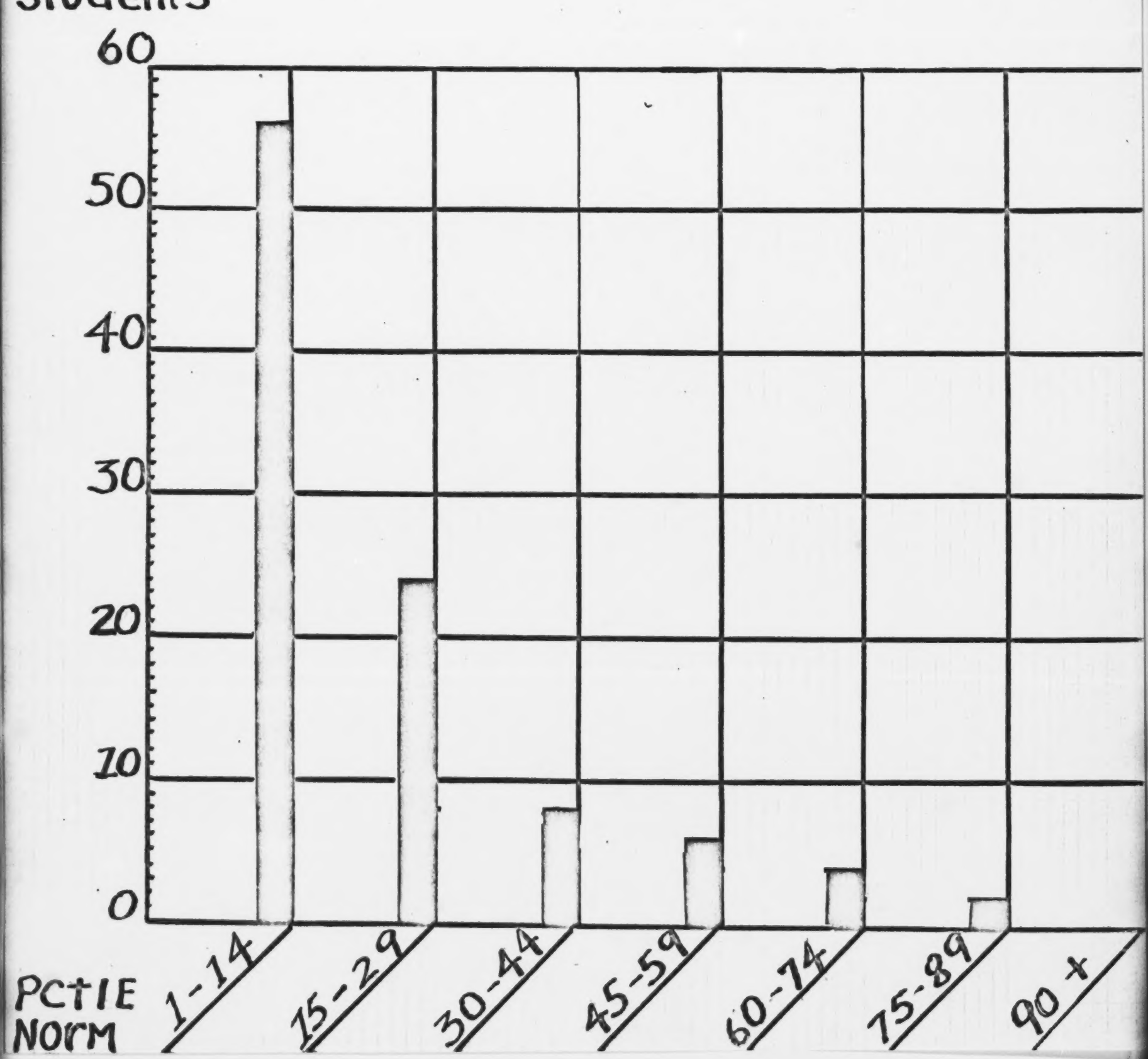


Table 8

INTERNAL CORRELATION BETWEEN SUBTESTS OF ITED

(78 Students)

ITED SUBTESTS AND COMPOSITE	1	2	3	4	5	6	7	8	9
1. Understanding basic social concepts									
2. Background in the natural sciences	.689								
3. Correctness and appropriateness of expression	.536	.443							
4. Ability to do quantitative thinking	.614	.653	.472						
5. Ability to interpret reading materials in social studies	.555	.462	.610	.407					
6. Ability to interpret reading materials in natural science	.550	.585	.564	.543	.645				
7. Ability to interpret literary material	.591	.621	.604	.538	.616	.659			
8. General vocabulary	.689	.690	.595	.597	.683	.714	.754		
9. Composite 1-8	.785	.796	.759	.734	.769	.802	.838	.890	

Internal correlation between subtests of ITED. 78 students.

so it appears that no particular test was out of line. These students did not do well on any of them.

TOEFL Comparisons

The distribution of TOEFL scores is quite different from ITED. It resembles a normal curve, with a few students high and low, and most of them in the middle. The mean composite score is 483, median 486. Mean for foreign students is 487. Fifty-six students or more than 40%, scored above the foreign student mean. The IAIA students' rank in comparison with foreign student percentile of mean on the subtests and composite appear in Table 9. They show a wide range rather than the ITED clustering in the lowest percentiles. Thus it appears that the TOEFL is not too hard for these students. They are much like the population providing the norms.

Table 9

Grades of IAIA Students (Number: 133)

		9		10		11		12		13	
	TOEFL	Mean Score	Pctle	Mean Score	Pctle	Mean Score	Pctle	Mean Score	Pctle	Mean Score	Pctle
1.	Listening comprehension	54.4	67	57.6	77	60.3	81	58.3	77	62.3	85
2.	English structure	49.5	53	53.5	71	56.7	79	54.0	71	55.2	71
3.	Vocabulary	43.9	29	46.0	42	50.3	56	48.1	49	54.2	67
4.	Reading comprehension	35.6	7	34.6	5	37.5	12	36.9	10	39.3	12
5.	Writing ability	35.5	6	36.6	8	38.7	12	38.0	12	39.9	13
6.	Composite	437.7	28	456.8	36	487.0	47	470.5	43	502.2	58

Mean standard scores on TOEFL, and percentile of the foreign student mean represented by these scores in grades 9-13 (based on ETS norms of foreign students).

The group of native speakers of English who had scored below the 30th percentile on the American College test showed quite a different distribution of means on TOEFL. Table 10 shows that their scores were skewed in the opposite direction from the IAIA ITED skew, with all means above the 75th and Tests 1, 2, and 3 above the 90th percentile.

Table 10

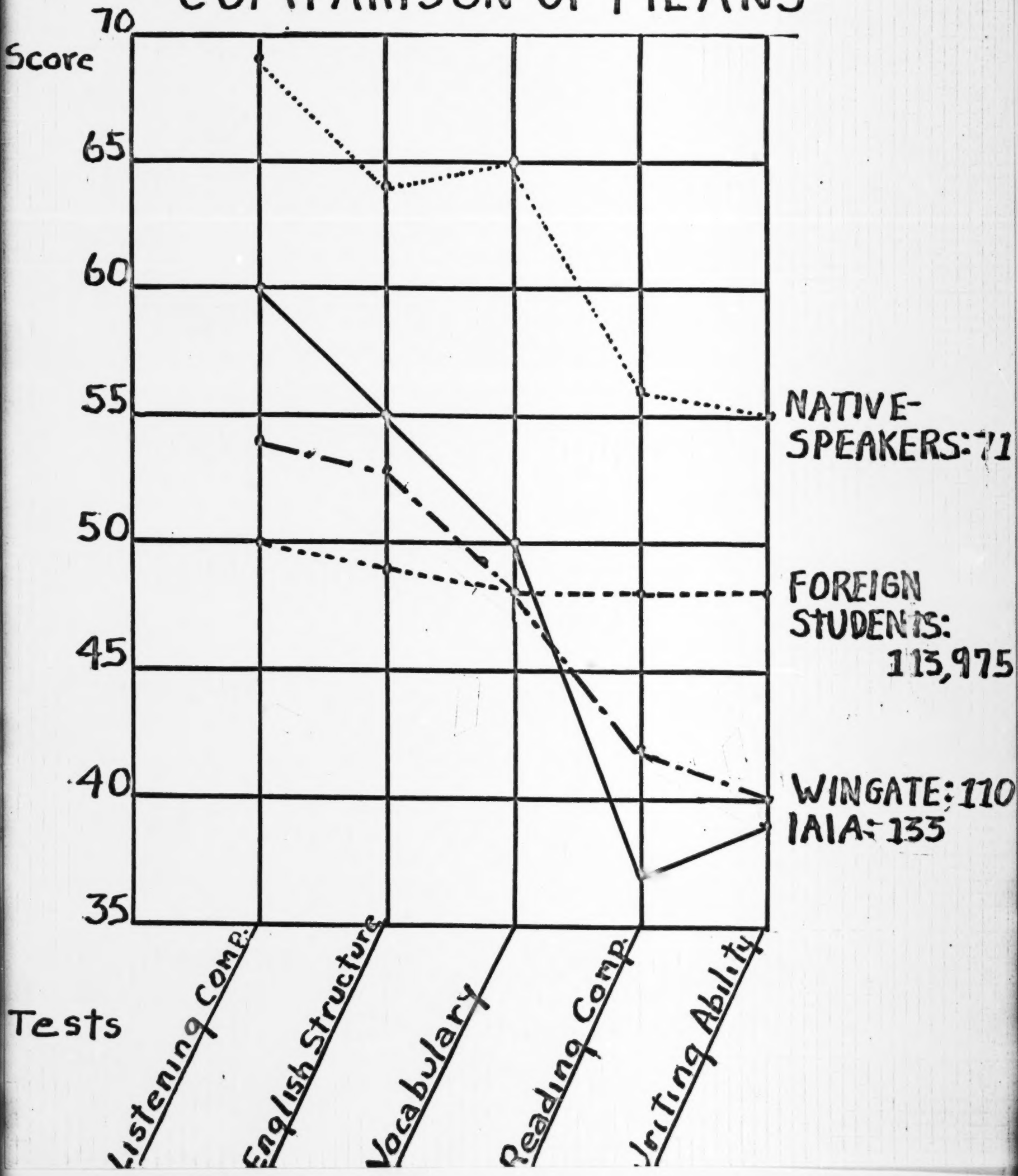
Grade 13 Native-speakers of English (Number: 71)

TOEFL	Score	Percentile of Mean
1. Listening comprehension	69.5	97
2. English structure	64.2	98
3. Vocabulary	65.4	94
4. Reading comprehension	56.5	81
5. Writing ability	55.4	78
6. Composite	622.0	95

Mean standard scores on TOEFL, and percentile of the foreign students' mean represented by these scores. College freshmen, native-speakers of English. (Interpretive Information 1970, p. 24)

Table 11 shows in graphic form the comparison between mean scores of two Indian groups, the norm group of 113,975 foreign students, and native speakers of English on the TOEFL. It is interesting that the direction of the line for Indian and native-speakers is similar--all these students fall down in reading and writing ability, though Indians fall much lower than native speakers. Foreign students, however, perform almost identically on all tests, not reaching up to the level of Indians on listening comprehension and English structure (tests of fairly basic

TOEFL SUBTESTS COMPARISON OF MEANS



grasp of the language for every-day communication) but far exceeding them on reading comprehension and writing ability. Only in vocabulary are the two groups very close.

One possible conclusion from this would be that teaching reading and writing in awareness that one is dealing with a second language--thus concentrating on certain linguistic aspects rather than upon semantic, cognitive, or affectional content--is more successful than teaching those subjects as if one were dealing with a first language, whether such is the case or not. (Cf. native speakers.) Or perhaps they teach reading and writing more thoroughly abroad.

Grade level TOEFL scores show a steady increase from the ninth through the thirteenth grades, with the exception of Listening Comprehension and English Structure, in which the twelfth grade falls down.

ITED scores, on the other hand, show no significant pattern of increase. Four out of eight tests, as well as the composite, register a decrease between grades 10 and 12. All but two tests show a percentile decrease, and these two merely remain at the same low level. Table 12 shows the percentile of the norm reached by IAIA students on the TOEFL composite. Compare this with Table 7, which gives the same information on ITED.

Correlation between mean scores on the TOEFL and ITED are shown in Table 13. These correlations are high, though not as high as the TOEFL internal correlations shown in Table 14. Internal correlationsfor foreign students are included for comparison.

Table 10

TOEFL PERCENTILE
IAIA

Number: 133

47% Above 50th Pctle of norm

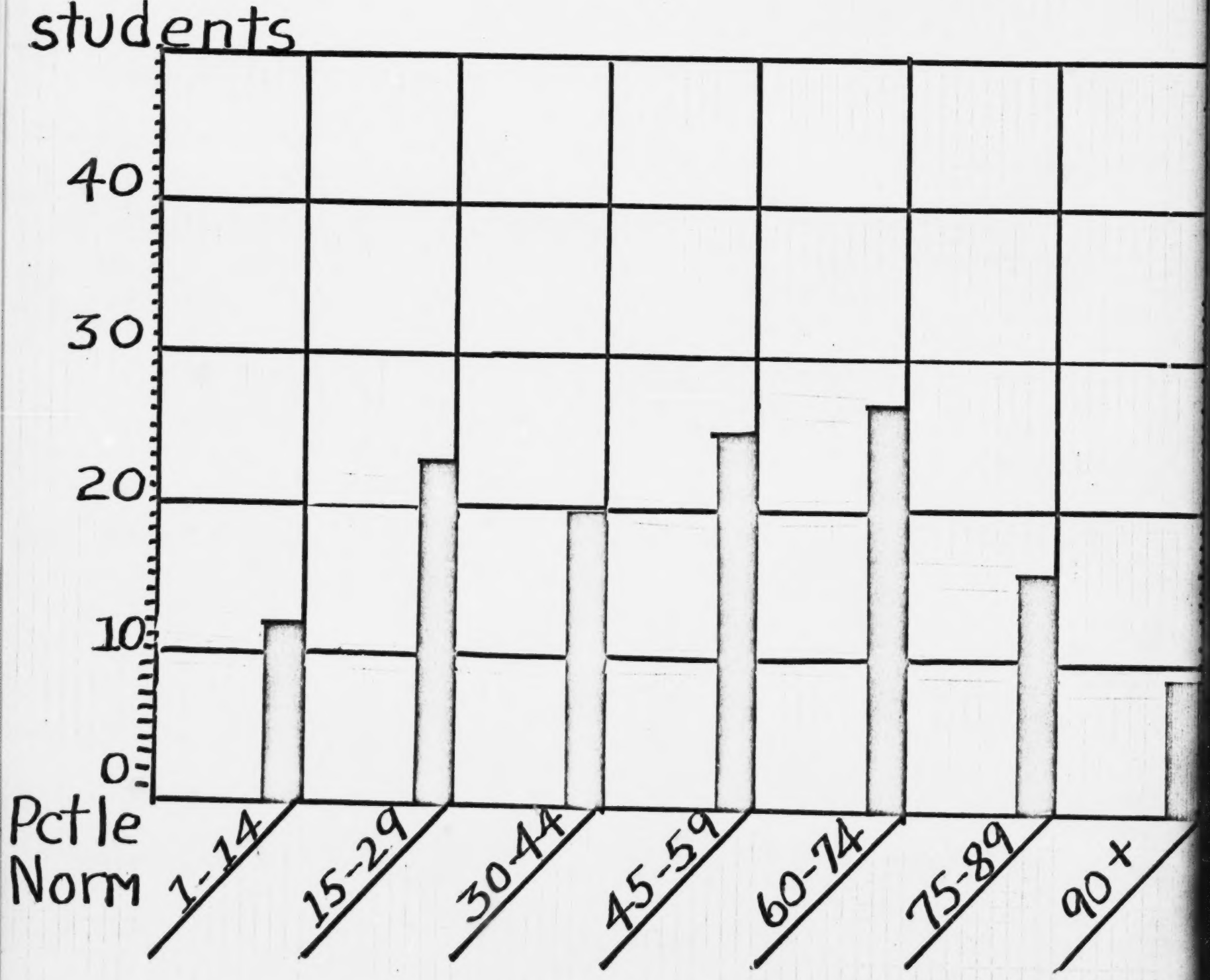


Table 13

ITED	TOEFL 1 Listening Comprehension	2 English Structure	3 Vocabulary	4 Reading Comprehension	5 Writing Ability	6 Composite
1 Understanding basic social concepts	.646	.616	.661	.566	.643	.723
2 Background in the natural sciences	.661	.587	.663	.547	.600	.707
3 Correctness and appropriateness of expression	.503	.565	.633	.484	.679	.662
4 Ability to do quantitative thinking	.635	.555	.596	.490	.611	.667
5 Ability to interpret reading materials in social studies	.517	.563	.558	.499	.570	.623
6 Ability to interpret reading materials in natural science	.617	.558	.621	.498	.605	.671
7 Ability to interpret literary material	.694	.679	.768	.585	.697	.794
8 General Vocabulary	.736	.658	.752	.558	.656	.780
9 Composite 1-8	.783	.737	.830	.647	.786	.876

Correlation of subtest and composite scores, TOEFL and ITED, 100 students.

These correlations are very similar to those obtained between ITED scores and college freshman grades (ITED 1966, p. 21).

Table 14

TOEFL SUBTESTS	1	2	3	4	5	6
1. Listening comprehension						
2. English structure	.780					
3. Vocabulary	.795	.765				
4. Reading comprehension	.543	.459	.599			
5. Writing ability	.680	.635	.734	.644		

Internal correlations between subtests of TOEFL. 133 students of IALA

TOEFL SUBTESTS	1	2	3	4	5
1. Listening comprehension					
2. English structure	.628				
3. Vocabulary	.536	.723			
4. Reading comprehension	.637	.664	.689		
5. Writing ability	.564	.786	.760	.717	

Internal correlations between subtests of TOEFL. 113,975 foreign students February 1964-June 1969. (Interpretive Information 1970, p. 14)

The highest correlations are between vocabulary tests and composites:

TOEFL Vocabulary/TOEFL Composite	.925
TOEFL Vocabulary/ITED Composite	.830
TOEFL Vocabulary/ITED Vocabulary	.752
ITED Vocabulary/ITED Composite	.890
ITED Vocabulary/TOEFL Composite	.780

It seems that the vocabulary sections of the tests are a good measure of the whole test, and of the students' language and achievement.

The correlations obtained between subtests of these two tests suggests that they measure much the same aspect of ability. Factor analysis bears out this conclusion, as we will see below.

Prediction of College Success

According to the TOEFL prediction scale (Table 2, p. 14), IAIA students are distributed as follows:

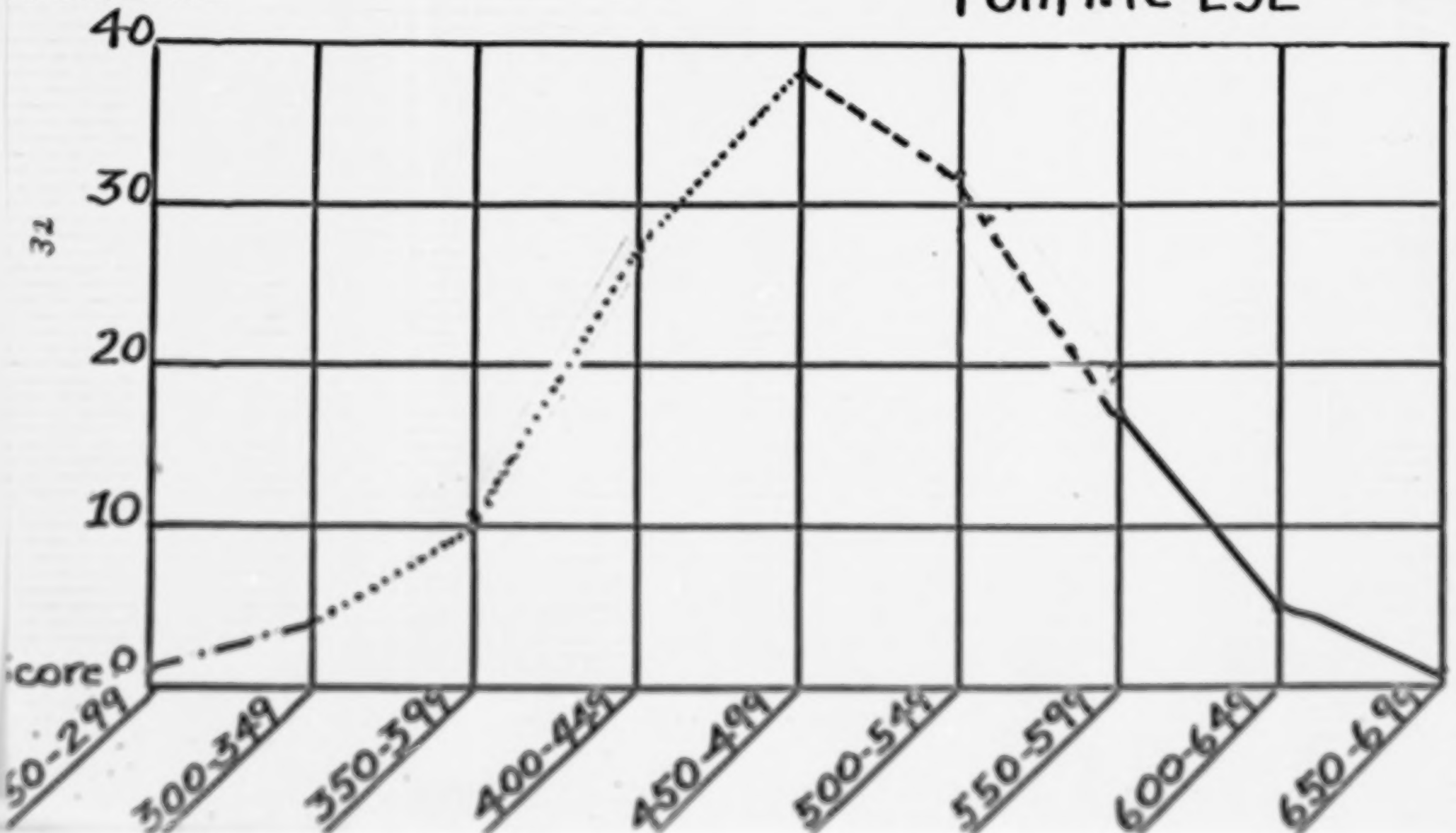
TOEFL SCORES	CATEGORY	NUMBER OF STUDENTS
550+	No restrictions	23
450-549	Need some English as a Second Language. No restrictions on class load.	70
300-449	Need considerable English as a Second Language and reduced class load.	39
200-299	Need fulltime English as a Second Language	1
	TOTAL	133

Seventeen percent of these students need no restrictions because of English, 53% require some specialized English as a Second Language, 29% need an intensive or semi-intensive course. Only a negligible number are unable to enter college because of the language handicap. Table 15

TOEFL COMPOSITE

Number: 133
Mean: 483
Median: 486

No restrictions ——
Some ESL – – – – –
Reduced load + ESL ·····
Full time ESL —·—·—



shows this distribution in graphic form using smaller score intervals for greater clarity.

This of course does not tell us what to do about low achievement scores, which do not predict substantial college success either. We can only say that 82% of Indian students in our sample, if they went to college next year, should be given from "some" to "considerable" ESL training in college. Since half the students in the study were of college age, a goodly proportion of this half undoubtedly also fall into the 82% who need English as a second language.

This conclusion is supported by a study made at Fort Wingate High-school in 1966, in which the TOEFL was given to 110 Navaho students chosen as the school's best scholars. This group showed a result similar to the IAIA distribution. Based on the entrance requirements of various universities, from 35% to 67% of Wingate's best students would have needed ESL instruction (Hopkins 1966). Wingate TOEFL subtest scores are found on Table 11.

Bell Comparisons

The Bell Adjustment Inventory has been left to the last because we really did not learn much from it. Our hypothesis, that there would be a positive correlation between poor adjustment scores and low ITED and TOEFL scores was not proved. The table of correlation (Table 16) below shows almost no relation. Most Bell means were a bit above the standard score mean of 50, suggesting a trend toward poorer rather than better adjustment in general. These means are less spread out than TOEFL means. The Bell range is 15, less than one standard deviation above and below 50.

while TOEFL mean scores range over 22 points.

Table 16

Bell Adjustment Inventory	TOEFL 1 Listening Comprehension	2 English Structure	3 Vocabulary	4 Reading Comprehension	5 Writing Ability	6 Composite
1 Home adjustment	-.237	-.169	-.158	-.173	-.274	-.231
2 Health adjustment	-.365	-.311	-.229	-.268	-.345	-.345
3 Submissiveness	-.104	.025	.037	-.032	-.036	-.022
4 Emotionality	-.100	-.093	-.055	-.160	-.171	-.127
5 Hostility	-.075	-.073	-.086	-.079	-.142	-.104
6 Masculine-feminine	.185	.058	.222	.333	.257	.238

Correlations between subtests and composite of TOEFL, and tests of Bell Adjustment Inventory.

MEAN SCORES

Bell Adjustment Inventory	TOEFL
1. 51.325	58.167
2. 55.947	54.038
3. 55.400	47.679
4. 56.220	36.423
5. 54.569	37.538
6. 41.848	467.692

No correlation reached significant size. The highest was between Health Adjustment and Listening Comprehension--and it is negative. Apparently the worse your health adjustment, the better your listening or vice versa!

In individual cases, unsatisfactory adjustment scores were found to accompany low TOEFL scores. Since the Bell requires written verbal expression, and writing ability shows the lowest mean of all the TOEFL tests, we may wonder if the Bell Adjustment Inventory can be trusted to measure the adjustment of students who are poor in English reading comprehension and writing.

Though no statistical proof can be found in this data, we still intuitively believe that there is a positive correlation between students' English skill and their self-concept. The Bell Inventory, however, does not measure it.

Factor Analysis

The data were factor analyzed in the four sets mentioned earlier. The analysis of Set One, including two IQ measures, the TOEFL, ITED, and Bell developed three distinct factors. One, representing 50% of the variability, included both IQs, all TOEFL tests and ITED tests. The second, 12%, included all Bell tests except one. The final factor, with a weight of 6%, included only the Bell Masculine-Feminine scale. Sexuality apparently forms a factor by itself.

The second analysis, excluding the Bell Inventory, also produced three factors, subdividing the language component of the first analysis. Sixty-two percent of the variability still fell into one factor. The second

factor, weighing 10%, included nonverbal IQ and listening comprehension. A third factor, accounting for 6% of the total, was made up of English structure from TOEFL and correct expression on the ITED. Verbal IQ, reading literature, and the TOEFL composite also added some weight to factor three.

The third set of data, which omitted ITED, showed the same division as the first set: 42% of the variability was a language factor including IQs and TOEFL. Thirty-two percent was in an adjustment factor, and 9% in sexuality.

The factor analysis thus seems to make it clear that both TOEFL and ITED measure something similar--English language facility. TOEFL can be factored to separate listening comprehension and English structure from the rest of the test, as somewhat different skills. Bell Adjustment Inventory measures something quite different, and one of its scales, the masculine-feminine measure, stands alone.

Conclusions

This study seems to warrant two conclusions. First, the TOEFL is a valid measure of English language skill of Indian students. Results are close enough to those of the non-native speakers of English for which the test was written to suggest strongly that similar abilities are being measured. And the distribution of scores is normal enough to tell us that the test is appropriately difficult.

Second, since the TOEFL and ITED do not factor out into different factors, ITED also measures language ability. ITED results, however, strongly suggest a test that is too hard for the students, quite probably

because of a language handicap which is identified by the range of TOEFL scores.

One wonders how the foreign students who are admitted to American colleges and universities on the basis of TOEFL scores would perform on the ITED--possibly little better than the Indian students. The central difference here is, of course, that these foreign students presumably know the content of their course work in their own language. But the Indian students have no other language for learning except English--a language which apparently many of them do not know well enough to come near national norms on a standardized tests.

The Indian student with an inadequate command of English is therefore much worse handicapped than his foreign-student colleague who can, if necessary, review subject matter in his native language and translate. The Indian student is effectively prevented, by his lack of English skill during junior high and highschool years, from ever learning the more difficult levels of any subject that depends heavily on language--and most school subjects do.

Colleges that use TOEFL as an entrance tests for Indian students will have a clearer idea of the language ability of this group. One would then hope that they would not expect the Indian student to compete on an equal basis with the white middle-class native-speaking student, taking the same curriculum, measured by the same tests, coping with Freshman English 101. The Indian student should be given the same consideration as the foreign student, with intensive or semi-intensive ESL as needed, and adjustment of course load if indicated.

The generally low level of TOEFL scores for students who have had

what amounts to total immersion treatment in English for 11 or 12 years suggests that we must greatly increase our emphasis on teaching English as a second language. Total immersion does not work well enough--some people will "pick up" the language, but many will pick it up with gaps that leave the whole structure weak. The weakness may not be severe enough to prevent the student from passing through school, especially if C and D grades are accepted and competition is with others whose handicaps are similar. But when the student moves into a larger environment, and the competition grows stiffer, the language handicap is ever more of a problem.

We must concentrate on prevention, rather than remediation. It is very difficult to relearn a language after you have thoroughly practiced and overlearned many mistakes of sound, structure, and meaning. All of these aspects of English should be taught to criteria before the student is expected to make much progress in subject matter.

It is outdated and ridiculous to image that Indian students have less innate ability than the population at large. Undoubtedly they show, within their various tribal divisions, the same range of ability to be found in any ethnic or socially delimited group. However, it is also undoubtedly true that they are handicapped in their interaction with native-speakers of English by the fact that English is their only language of instruction, and yet they do not know it much better than foreign language students who come ot our shores fully educated in their native languages.

Since the choice of providing the Indian student with a complete secondary education in his native tongue is hardly a practical possibility, we must concentrate on making it possible for him to learn English well

enough to become <u>educated</u> by means of English. It is in this task that, so far, TOEFL and ITED tell us we have not fully succeeded. It is a challenge that we must meet, because it is the only way that equality of educational opportunity can be provided to the Indian.

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